fibers randomly dispersed in an epoxy is attached to an outer surface of the bonded disk stack and enables the disk stack to withstand at least one 100 kA impulse without breaking the face-to-face bonds.

As explained in the application (e.g., at page 3, lines 1-11 and at page 12, lines 23-30), when a disk stack is subjected to a high-current impulse (e.g., as a result of a short circuit condition), the resulting thermo-mechanical shock wave can crack the stack near the mid-plane of the stack. This tendency to crack limits the size of art individual surge arrester elements as well as the overall length of the stack.

As explained above, the apparatus of claim 95 includes a stack of MOV disk elements that are bonded together and reinforced by a resin composition reinforcing structure. Bonding of elements in the stack provides mechanical support for the surge arrester and reduces the deleterious effects of the thermo-mechanical forces associated with a high current surge. See application at page 9, lines 10-16. The reinforcing structure provides axial and circumferential constraining forces to the disk stack, which enables the stack to withstand the thermo-mechanical shock of a 100 kA impulse without breaking face-to-face bonds. See application at page 13, line 1 – page 14, line 2.

Kester describes a surge arrester subassembly that includes electrical components stacked in an axial array and an insulative coating disposed over the outer surface of the axial array. See Kester at col. 3, lines 18-21. According to Kester, "the coating has a coefficient of thermal expansion that is greater than the coefficient of thermal expansion of the electrical components . . . so that when the coated array is cooled below the cure temperature, the coating will tend to shrink more than then electrical components, thereby exerting compressive forces on the array." Kester at col. 3, lines 26-33. The coating generally includes resinous layers (e.g., polyester, phenolic, or epoxy resin layers). See Kester, col. 5, lines 39-48. Thus, Kester describes the advantages of using a resin coating having a high coefficient of thermal expansion to exert longitudinally compressive mechanical forces on the array. The surge arrester subassembly of Kester is described with reference to a high-current (e.g., 10 kA) device, see Kester at col. 4,

lines 14-18, for protecting electrical equipment from high-current surges, e.g., due to lightning strikes, see Kester at col. 1, lines 17-29.

In contrast, Suzuki discloses an "invention [that] relates to a . . . small-current-capacity semiconductor device used for a high voltage power circuit of an electron microscope, an X-ray apparatus, or a TV receiver." Suzuki at col. 1, lines 8-11. Suzuki discloses semiconductor pellets that are laminated together and that are covered with a glass layer. See Suzuki at col. 3, lines 9-14 and lines 48-52.

Suzuki's invention is categorically different from Kester's invention, because Suzuki is concerned with low-current semiconductor devices while Kester is concerned with surge arrestors subjected to extreme operating conditions, such as, high current and high mechanical force conditions due, for example, to a lightning strike. As such, one skilled in the art would have had no motivation to apply the teachings of Suzuki to the disclosure of Kester.

Although Suzuki describes the necessity of bonding a number of semiconductor pellets together with aluminum solder so that the bonded stack can be used for high-voltage applications, Suzuki also describes the mechanical problems caused by the bonds between adjacent pellets in the stack. For example, Suzuki states that because aluminum solder has a coefficient of thermal expansion approximately one order of magnitude greater than that of silicon semiconductor pellets, bonding of the pellets may cause damage to the pellets during fabrication of the device. See Suzuki, col. 2, lines 5-26. Even if the device is not damaged during fabrication, subjecting such a mechanically-stressed device to a high current impulse during operation would likely result in damage to the device because the bonds provide a thermo-mechanical weakness in the composite device. Thus, bonding of semiconductor pellets with aluminum solder as disclosed in Suzuki introduces a mechanical stress on the bonded device, which is a stress that Kester would seek to avoid. For at least these reasons, one skilled in the art would not have been motivated to apply the bonding of adjacent semiconductor pellets disclosed for the low-current device of Suzuki to Kester's high-current surge arrestor composed of a stack of metal oxide varistors.

Additionally, Suzuki describes the advantages of using glass, as opposed to epoxy resin, to cover and insulate the stack of pellets because the coefficient of thermal expansion of glass is close to that of the silicon pellets such that axial mechanical stress on the pellets is reduced. See Suzuki, col. 1, lines 48-64. A glass layer, rather than an epoxy layer is used to cover the pellets because, according to Suzuki, epoxy resin "has the disadvantage that the increased sectional area of the epoxy resin causes strain" and because "[e]poxy resin generally has a coefficient of thermal expansion higher than a semiconductor pellet by one order, and the semiconductor pellet develops a tensile stress at high temperatures due to the difference in the coefficient of thermal expansion, to which the semiconductor pellet easily succumbs." Suzuki at col. 1, lines 43-56. Suzuki discloses that "[t]his problem of tensile stress is solved by the use of a first insulating layer of glass . . . ." Suzuki at col. 1, lines 57-58. Thus, the difference in the coefficients of thermal expansion between the epoxy coating and the electrical components, which Kester exploits as an advantageous aspect of his invention, for Suzuki is a disadvantage that is overcome by using a construction different from the one recited in claim 95.

Thus, Kester and Suzuki each teach away from the combination of the two references and there would have been no motivation to combine the two. For at least this reason, applicants request reconsideration and withdrawal of the rejection of claim 95. Claims 96, 103, and 104 depend from claim 95 and are allowable for at least the same reasons.

35 U.S.C. § 103(a) Kester / Donnola / Suzuki Rejection

Claims 22-27, 66-93, and 99-100 were rejected as being unpatentable over Kester in view of Donnola (U.S. Patent No. 6,185,813) and Suzuki. Applicant requests withdrawal of the rejection of independent claim 22, as well as its dependent claims because there would have been no motivation to combine Suzuki with either Kester or Donnola in the manner suggested by the Examiner.

As explained above, there would have been no motivation to combine Suzuki with Kester. Furthermore, there would have been no motivation to combine Suzuki with Donnola. Like Kester, Donnola relates to high-current (e.g., several tens of kA) lightning arrester, see

Donnola at col. 1, lines 4-27, and, like Kester, Donnola discloses covering the electrical components of the arrester in an epoxy resin, see Donnola at col. 5, lines 43-48, and Suzuki teaches away from the combination with Donnola for the same reasons that it teaches away from the combination with Kester. For at least this reason, applicants request reconsideration and withdrawal of the rejection of claim 22. Claims 23-27, 66-93, and 99-100 depend from claim 22 and are allowable for at least the same reasons.

35 U.S.C. § 103(a) Kester / Donnola / Schmidt Rejection

Claims 1, 3, 5-20 and 55-65 and 97-98 were rejected as being unpatentable over Kester in view of Donnola and Schmidt (U.S. Patent No. 5,602,710). This rejection is respectfully traversed.

Independent claim 1 is directed to an electrical apparatus that includes a monolithic MOV disk having a rating of at least 6 kV and a reinforcing structure "constructed so as to enable the monolithic MOV disk to withstand at least one 100 kA impulse without cracking." Applicant requests reconsideration and withdrawal of this rejection because neither Kester, Donnola, Schmidt, nor any combination of the three describes or suggests a monolithic MOV disk having a rating of at least 6 kV and a reinforcing structure that would enable such a monolithic MOV disk to withstand a 100 kA impulse without cracking.

Kester describes the example of a 10 kV distribution class surge arrester that includes three MOV disks. In view of the arrester's 10 kV rating, each MOV disk would have a rating of approximately 3.3 kV. Thus, Kester does not describe a monolithic MOV disk having a rating of 6 kV.

However, the Office action proposes that Kester inherently discloses use of a single MOV disk having a rating of 6 kV. The applicant concedes that, although Kester describes his invention with respect to a 10 kV distribution class surge arrester, Kester notes that his invention is "not limited in use in a distribution class surge arrester, or in any size or rating of the surge arrester." Col. 4:18-21. However, this remark is no way indicates that the Kester contemplates use of a surge arrestor having a single 6 kV MOV disk that can withstand a 100 kA impulse.

Indeed, one skilled in the art would appreciate that Kester described a stack of three 3.3 kV MOV disks to achieve a surge arrester having an overall rating of 10 kV precisely because the surge arrester would not have worked with a single 10 kV disk. Rather, three MOV disks having a 3.3 kV rating were necessary in Kester to produce a surge arrester having an overall rating of 10 kV because a high-current impulse would have destroyed a single 10 kV disk. Thus, Kester's general remarks about the size of the surge arrester cannot be understood to disclose inherently the use of a single 6 kV MOV disk configured in a reinforcing structure, such that the disk could have withstood a 100 kA impulse without cracking.

Like Kester, Donnola and Schmidt also fail to describe or suggest the use of a 6 kV MOV disk. Accordingly, reconsideration and withdrawal of the rejection of claim 1 are respectfully requested.

Claims 3, 5-20, 55-65, and 97-98 depend from claim 1 and are allowable for at least this reason.

35 U.S.C. § 103(a) Kester / Schmidt Rejection

Claims 94, 101, and 102 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kester in view of Schmidt. Applicant requests reconsideration and withdrawal of this rejection for the reasons discussed above with respect to claim 1.

35 U.S.C. § 103(a) Kester / Ramarge Rejection

Claims 95-96 and 103-106 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Kester in view of Ramarge.

At the time the invention claimed in the present application was made, the claimed invention and Ramarge were both either owned by or subject to an obligation to assign to the McGraw-Edison Company. Thus, a rejection over Ramarge under section 103(a) is not proper. See MPEP 706.02(l) – 706.02(l)(3). Contrary to the suggestion in the Office Action at paragraph 10, evidence in the file is not necessary to disqualify Ramarge as prior art, and the statement in

the first sentence of this paragraph regarding common ownership is sufficient to disqualify Ramarge. See MPEP 706.02(l)(2).

Accordingly, the applicant requests reconsideration and withdrawal of this rejection.

The $130 Terminal Disclaimer fee is enclosed. Please apply any other charges or credits to deposit account 06-1050, referencing Attorney Docket No. 08215-467001.

Respectfully submitted,

Date: 4/4/05

Mark R.W. Bellermann
Reg. No. 47,419

Fish & Richardson P.C.
1425 K Street, N.W.
11th Floor
Washington, DC 20005-3500
Telephone: (202) 783-5070
Facsimile: (202) 783-2331

40273056.doc